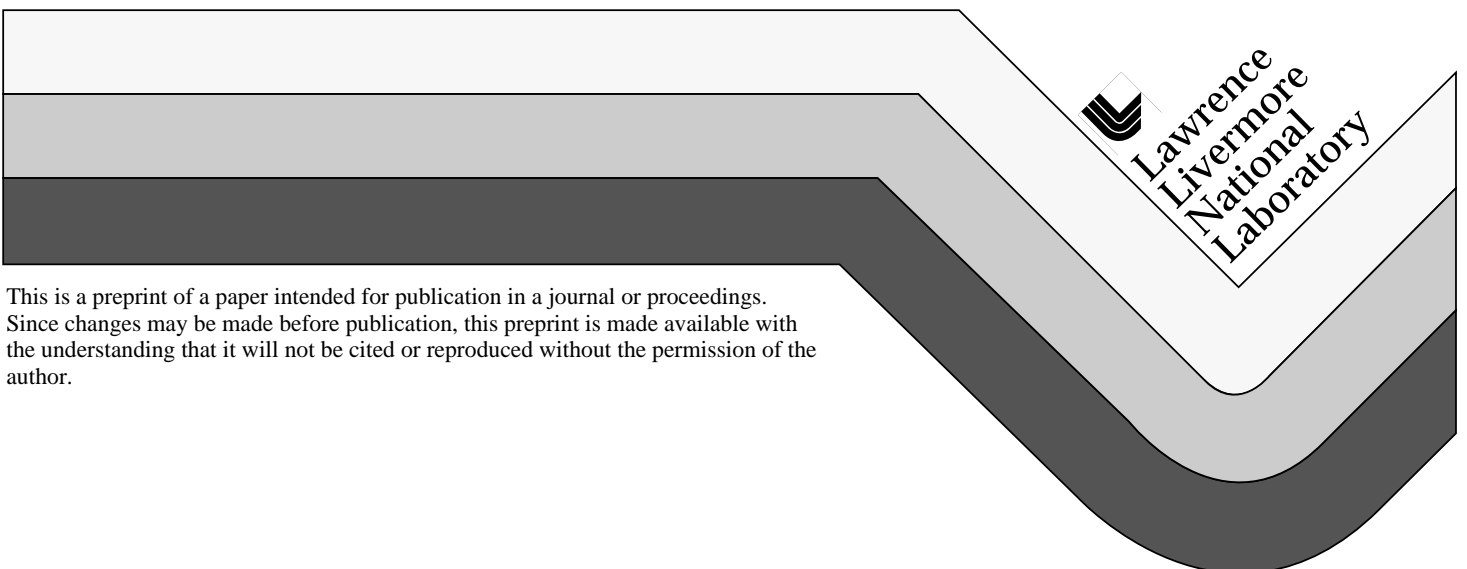


# Radiation Safety Training for Accelerator Facilities

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This paper was prepared for submittal to the  
*International Conference on Radiation Dosimetry*  
*Taipei, Taiwan*  
*March 31-April 2, 1997*

February 1997



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## **RADIATION SAFETY TRAINING FOR ACCELERATOR FACILITIES**

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### **INTRODUCTION**

In November 1992, a working group was formed within the U.S. Department of Energy's (DOE's) accelerator facilities to develop a generic safety training program to meet the basic requirements for individuals working in accelerator facilities. This training, by necessity, includes sections for inserting facility-specific information. The resulting course materials were issued by DOE as a handbook under its technical standards in 1996. Because experimenters may be at a facility for only a short time and often at odd times during the day, the working group felt that computer-based training would be useful. To that end, Lawrence Livermore National Laboratory (LLNL) and Argonne National Laboratory (ANL) together have developed a computer-based safety training program for accelerator facilities. This interactive course not only enables trainees to receive facility-specific information, but time the training to their schedule and tailor it to their level of expertise.

### **COURSE DEVELOPMENT**

The working group first met at LLNL for a week to develop an initial draft of the standardized training. After reviewing the draft, the group met at Jefferson Laboratory (formerly the Continuous Electron Beam Accelerator Facility) to make revisions. The revised draft was then sent out for review and comment outside the working group.

The standard course is designed for a broad target audience — defined as anyone with assigned duties in an accelerator facility. Normally, the course does not have a mandated repeat frequency or specified testing requirements. However, when the course is given as part of radiation worker training, retraining is required every two years and a test is administered. Individuals who are not radiation workers would take this course as part of their orientation.

### **COURSE CONTENT**

The original course was designed with a prerequisite of radiation worker training. Recently, DOE approved a stand-alone course for operators of radiation-generating devices (primarily x-ray machines). Lawrence Livermore National Laboratory has taken the lead in revising the accelerator facility training course to incorporate topics identified by DOE to be included in standardized core radiation worker training. Topics that have been incorporated include: regulations/standards, terms, limits, biological effects, and responsibilities. Incorporating applicable portions of radiation worker training is estimated to save some four to eight hours of the trainees' time.

The Radiation Worker Training for Accelerator Facilities course includes the following:

- Introduction
- Regulations and Standards
- History of Accelerators
- Radiological Concerns of Accelerators
- Biological Effects
- Types of Accelerator
- Monitoring
- Radiological Controls
- Responsibilities

## **COMPUTER-BASED TRAINING**

Because of the diverse target audience (from scientists to support personnel) and because of the very short time frame for delivering training and qualification (particularly for visitors), the accelerator facility training course is an ideal candidate for computer-based training (CBT). In the fall of 1996, a task force met at Argonne National Laboratory to design a CBT course for accelerator facilities. The first version of that course is now in use at ANL, and LLNL is using it as a template for developing a stand-alone CBT course for radiation workers in accelerator facilities. An important feature of CBT is that it enables an individual to obtain information at several different levels of complexity. When a person logs on, he/she is prompted to identify his/her facility and job at that facility. This results in customized training tailored to that person's needs. In addition to the CBT, a comprehensive study guide is provided. The follow-up to the CBT course is a practical exercise in which the individual has an opportunity to interact with subject matter expert(s).

## **COURSE MATERIALS**

The standardized training materials consist of a training management guide, a study or student guide, an instructor guide, and viewgraphs. These materials are now being issued by DOE as a technical standard and are available on the Internet at the DOE Radiation Safety Training home page. The materials were developed for the Macintosh in Microsoft Word, with viewgraphs in Aldus Persuasion. They are also available from DOE in Word Perfect for the PC. The CBT is in Authorware. When Authorware is in its packaged form, it does not need the Authorware software to run. Because the CBT programs are large, they are only available on compact disk.

## **ACKNOWLEDGMENTS**

The author would like to acknowledge James Allan of the Stanford Linear Accelerator (SLAC), who chaired the working group, and the other working group members for their contribution to the standardized training materials: David Boehliem, Fermi Laboratory; Steve Butala, Argonne National Laboratory; James Patterson, DOE (LLNL); and Keith Welch, Jefferson Laboratory. Additional acknowledgments go to Peter O'Connell of DOE EH-51, who has the responsibility for approving and distributing training standards, and to Mike McNaughton of Los Alamos National Laboratory, who is primary author of the radiation-generating device training.